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NEW COUNTDOWN

BOOK 1

TEACHING GUIDE

THIRD EDITION



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Introduction

New Countdown 1 is the fourth book of an eight-book course specially designed for the young mathematician of today's fast-changing world. Building on the foundation established in New Countdown Starter, Primer A and Primer B, it leads the student to the confident handling of more advanced operations and concepts: working with 2-digit numbers, the concept of one hundred, addition, subtraction, up to 2-digit numbers multiplication, division facts up to 2 digit, time and its measurement, key geometrical concepts, and the idea of fractions.

New Countdown 1 covers all the concepts recommended for Class 1 learners by all major syllabuses; it also reaches beyond them in a systematic and carefully graded way. As in the preceding books of the course, worked examples are provided for every concept introduced, and a range of activities seek to guarantee the interest and involvement of every learner.

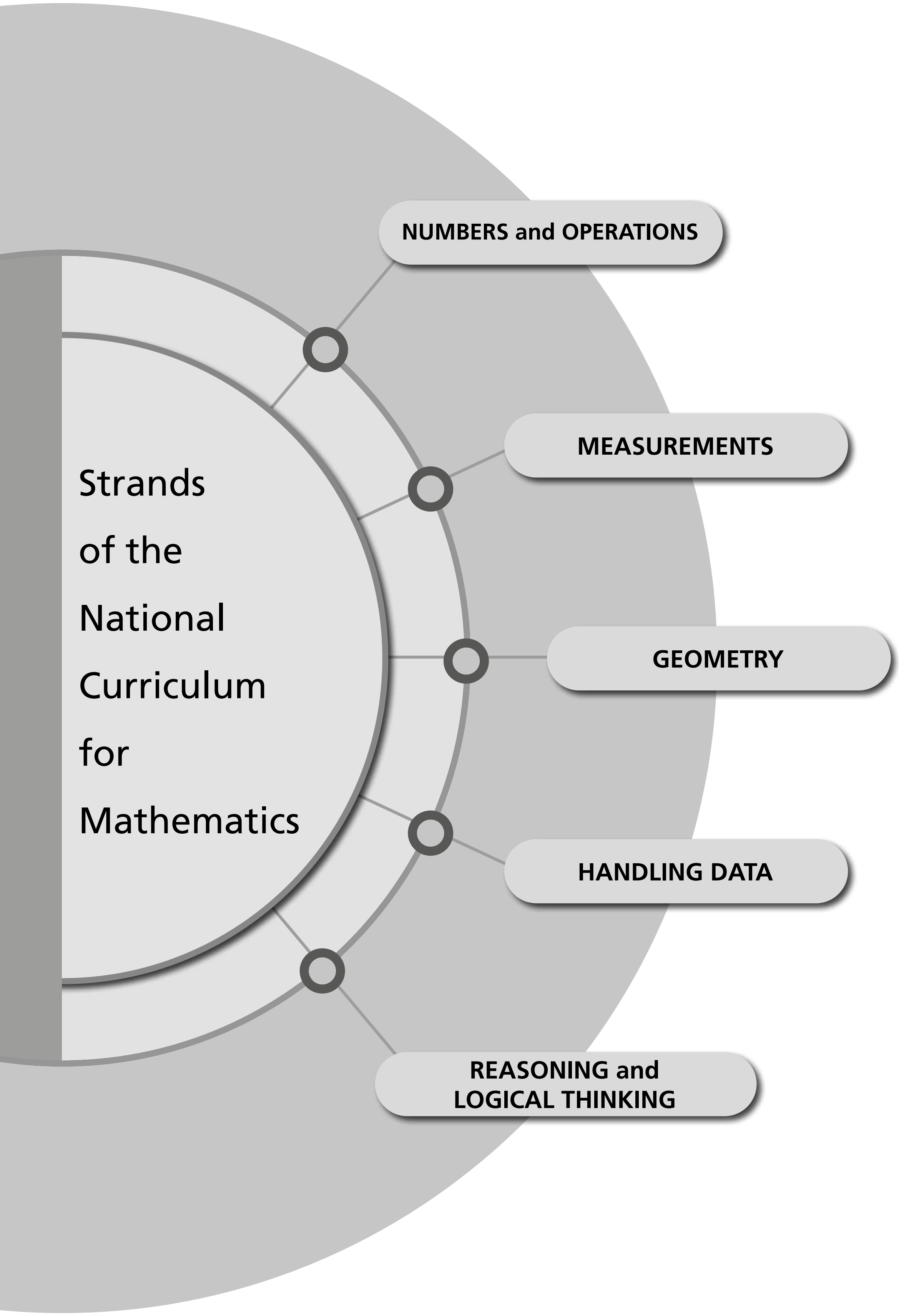
New Countdown 1 comprises twelve units, each containing work which can be covered comfortably in the space of a term. We recommend that you follow the topics in sequence to develop the understanding of the student gradually and smoothly. There is a review section at the end of the book containing practice sheets and activity sheets. Here are some suggestions for practical work and simple teaching aids which you can incorporate in your lessons. They will reinforce learning and add interest, variety and a practical dimensions to your classes.

About the Teaching Guide

The Teaching Guide offers extensive teaching ideas linked with curriculum and adaptable activities to different settings. It provides the strands and benchmarks of the National Curriculum 2006. The strands of the curriculum have been explained in an effective way, as a support to teachers' teaching. Activities designed for maximum learning in the classroom and daily life are mentioned in each unit. Teachers have the liberty to use any of these or the one mentioned in the model lesson plan, or any other activity of their choice depending on the interest of the students and time available.

A syllabus matching grid is also given to facilitate the teacher to connect the students' learning objectives with the text in the book. The teaching guide emphasises the development of a positive attitude towards learning maths by enhancing memory retention, building concentration, and creating curiosity for maths. It contains a model lesson plan in each unit to implement time appropriate, effective activities.

Shamlu Dudeja


Strands of the National Curriculum for Mathematics
NUMBERS and OPERATIONS
MEASUREMENTS
GEOMETRY
HANDLING DATA
REASONING and LOGICAL THINKING

Syllabus Matching Grid

The left column of the following grid indicates SLOs in National Curriculum, whereas the right column indicates the text book units.

Unit 1 Concept Of Whole Numbers	
1.1 Numbers 0 – 9 i) Identify numbers 1 – 9. ii) Identify 0 as a number. iii) Read numbers up to 9 in numerals and in words. iv) Write numbers up to 9 in numerals and in words. v) Count objects up to 9 and represent in numbers. vi) Match the numbers 0 – 9 with objects. vii) Count backward from 9. viii) Arrange numbers in ascending and descending order. ix) Identify which number (up to 9) comes • before/after a number, • between two numbers.	Unit 2
1.2 Numbers up to 100 i) Identify 10 as a number. ii) Compare and order the numbers 0 – 10. iii) Read numbers up to 99. iv) Write numbers up to 99. v) Count numbers up to 99. vi) Recognise the place values of numbers (tens and ones). vii) Identify the place value of the specific digit in a two digit number. viii) Compare one and two digit numbers. ix) Write numbers in increasing and decreasing order. x) Place the mixed numbers in order. xi) Order the set of numbers from 0 to 99 in increasing and decreasing order xii) Identify which number (up to 99) comes • before/after a number, • between two numbers. xiii) Write numbers in increasing and decreasing order up to 99. xiv) Count in tens and Recognise 100 as a number. xv) Identify and write missing numbers in a sequence from 1 to 100. xvi) Count and write the number of objects in a given set. xvii) Identify the position of objects using ordinal numbers such as first, second, tenth, including representations 1st, 2nd etc.	Unit 2

1.3 Comparing and ordering i) Compare two or more groups in terms of number of objects. ii) Match objects having one to one correspondence. iii) dentify the number of objects in two groups to show 'more than' or 'less than'.	Unit 2
Unit 2: Number Operations	
2.1 Addition i) Compare numbers from 1 to 20 to Identify 'how much more' one is from other. ii) Recognise and use symbols of addition '+' and equality '='. iii) Add two one-digit numbers (sum up to 9). iv) Add a two-digit number with one-digit number. v) Add a two-digit number with 10s. vi) Add two two-digit numbers. vii) Complete equation such as D + 4 = 7 (include questions that sum up to 20). viii) Add mentally the numbers using real life examples. ix) Construct addition equations from given pictures.	Unit 3
2.2 Subtraction i) Compare numbers from 20 and find 'How much smaller?' ii) Recognise and use the symbol of subtraction '–'. iii) Subtract ones from ones. iv) Subtract ones from 2-digit numbers. v) Subtract tens from 2-digit numbers. vi) Subtract 2-digit numbers from 2-digit numbers. vii) Fill up the equation, such as 9 – D = 7, with proper number. viii) Subtract mentally the numbers given in simple real-life examples ix) Construct subtraction equation from given pictures.	Unit 4
Unit 3: Measurement of Length and Mass	
3.1 Comparison of objects Compare objects to identify: • long, longer, longest, • short, shorter, shortest, • tall, taller, tallest, • high, higher, highest, • heavy, heavier, heaviest, • light, lighter, lightest.	Unit 8

Unit 4: Money	
4.1 Pakistan currency i) Identify Pakistani currency coins (Rs. 1, 2 and 5). ii) Identify Pakistani currency notes (Rs. 10, 20, 50 and 100).	Unit 7
4.2 Equivalent sets of money i) Match a group of coins/notes to an equivalent group of different denominations. ii) Add and subtract money using the prices of objects (e.g. toys).	
4.3 Comparing Money i) Recognise money change (up to 100) to its equivalent denominations. ii) Deter mine if enough money is available to make a purchase. iii) Add different combinations of coins/notes	
Unit 5: Time and Date	
5.1 Time i) Recognise the hour and minute hands of an analogue clock. ii) Read and tell time in hours from the clock e.g., two o'clock. iii) Read and tell time in hours from the digital clock.	Unit 9
5.2 Date i) Name in order the days of the week. ii) Identify which day comes after/before a particular day. iii) Name (orally) the solar months of the year.	
Unit 6: Geometry	
6.1 Identification of basic shapes i) Recognise and match objects, from daily life, of similar shape ii) Identify the following basic shapes: • rectangle, • square, • circle, • oval, • triangle iii) Identify the basic shapes from real life objects. iv) Match similar basic shapes.	Unit 10

6.2 Patterns i) Identify and describe patterns with 2 or 3 elements. ii) Extend a given pattern of 2 to 3 elements.	Unit 11
6.3 Position Identify whether an object is placed • inside or outside, • above or below, • over or under, • far or near, • before or after, • right or left, of a given picture.	Unit 12

Note:

Unit 1: Getting Ready consists of concepts taught earlier.

Unit 5: Multiplication and Unit 6: Division have been introduced to give basic knowledge in a simple manner and to prepare students to study multiplication and division in depth in higher level.

Teaching Mathematics at Primary Level

Teaching Strands

To teach maths skills at the primary level, the teacher should use multiple teaching methods to maximise students learning. Maths activities such as counting, sorting, organising, and pattern making etc. are sources of engaging students in the learning. The knowledge of maths skills at the primary level may forecast the achievements of maths skills in future.

Materials which give hands-on experiences such as solid shapes, abacus, clocks, place value blocks, number lines, the place value chart, and play money should be provided to students to make connections to their learning.

It is essential to check that each student has mastered the topics previously taught and is confident about handling them before proceeding to teach new topics. Review activity relating to place value needs special emphasis.

Numbers and Number Operations

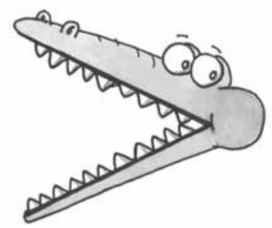
The crucially important concept introduced here is that of place value, a clear understanding of which is essential if a student is to progress in addition, subtraction, multiplication and division. It is well worth allocating plenty of time and activity-related practice to this concept. Use simple aids, such as matches or lollipop sticks bundled in tens, with loose ones serving as 'ones'. As your students progress, link the matchsticks with number cards of different sizes—a long one for 100 (in one colour), a shorter one for tens (in another colour) and an even shorter one for ones (in a third colour). Show how the matchstick bundles and ones can be represented by the superimposed number cards.

You can also make a giant number square chart, modelled on the one shown on page 40. Use this for a variety of point-and-say exercises and games, perhaps dividing your class into competing teams: ‘How many tens, how many ones?’; ‘What is the number name?’; ‘Add ten to this number and what do you get?’ are just a few of the possibilities here. Make sure you have an abacus in the classroom by the time you reach page 19.

In this section, students will also learn that the concepts of ‘greater than’, ‘less than’ can be shown by a simple symbol. To reinforce the point, make a giant crocodile’s head out of thick cardboard, and highlight the open jaws with a strong, bright colour.

Make sure you draw on both sides of the cardboard, so that the crocodile can be reversed. Ask some students to come to the front of the class and split them into two unequal groups. Let another student be the 'crocodile', he holds the cardboard head and points it towards the group with the larger number of students. Then write pairs of numbers on the board, and ask the students to come up in turn and show to which number the crocodile's head should point (his wide-open mouth should always be towards the greater number).

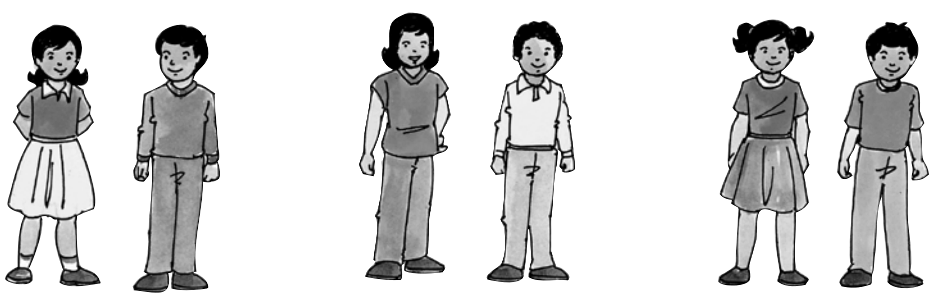
A number-hungry crocodile



They will learn the concept of ordinal numbers by identifying the position of objects You can arrange groups of student according to height (better still, get the other members of the class to do the arranging); and, of course, running races are an excellent way of teaching ordinal numbers ('Which student came first?', 'Which came second?', and so on).

In this section they will recognise and use symbols of addition '+', subtraction '–' and equality '='. They will learn to compute addition using two digit numbers horizontally and vertically both, add a two-digit number with 10s and complete sums such as --- + 4 = 7 (include questions that sum up to 20).

Make sure plenty of activity precedes and accompanies your teaching of multiplication and division. Here is a simple idea to introduce multiplication as repeated addition. Two students come to the front of the class. You draw a chalked circle on the floor and ask the two students to stand inside it. You then write 2 on the board. Repeat the exercise with two more students and a second circle, adding to the board 2 + 2. Extend the exercise to three groups.



The sum on the board now reads 2 + 2 + 2 = 6. From this you can easily lead students to the idea of three groups of two, or 3 × 2 = 6. Sorting trays are also excellent for teaching multiplication: for example, ask a student to place three objects in one section of the tray and put the right number card below. Ask her/him to repeat the exercise three times.

She/He can then count and write the sum 3 + 3 + 3 = 9, or 3 × 3 = 9. Use the counting tray with 2, 3, 4, 5 and 10 objects in each section.

They will learn the times table and acquire the concept of multiplication.

Chalked circles can also be used to introduce division. Ask 12 students to come to the front. You draw a series of small chalk circles on the floor; you then ask two of the 12 to stand inside one of the circles. Continue until all 12 are paired into circles, then ask the class 'How many twos have I?' The students count the twos and say 'There are six'. You can then demonstrate how this can be written: first, stage by stage as repeated subtraction (12 – 2 = 10; 10 – 2 = 8, and so on) and then as a division statement, 12 students ÷ 2 = 6. Make sure the students understand each part of the statement.

Encourage the students to use their sorting trays as they explore the concept of division. For example, ask them to choose 10 objects (buttons, seeds, and so on), then instruct them to put the objects, two at a time, into separate sections of the tray. At the end, they count the number of twos and write the exercise as a sum, 10 ÷ 2 = 5. To help with the concept of equal shares see pages 114-115, give the students 4 section trays and 12 objects, then ask them to put the same number of objects into each of the four sections.

On pages 118–119, New Countdown 1 shows the close relationship between multiplication and division. You can reinforce this point by drawing a set of 12 simple shapes on the board and then asking the student to count them. You then loop them into groups in the manner shown on page 118. Repeat this exercise with many other numbers, for example 6, 8, 9, 10, 15 and 20. The whole of this activity is very important; it helps students move freely from a multiplication fact to a corresponding division fact (for example, 5 × 2 = 10 leads to 10 ÷ 5 = 2). It also builds up an understanding of the commutative property of multiplication (e.g. 3 × 4 = 4 × 3).

Measurement

This part extends the idea of comparison into measurement. Here, New Countdown 1 presents some simple suggestions for activities. For example, on page 126 students are taught to use the metre rule to measure cloths, length of a table, and height of a plant. Make sure your students also have access to a metre rule and to a 15 cm pocket scale. Encourage your students to compare weights, as indicated on page 132. If possible, have a scale (a table model or even a hanging one with two pans) in your classroom so that you can show how it works. When teaching capacity, allow the students to pour water from one container to another; sand can also be used. Have ready, lots of empty containers of different shapes and sizes; plastic tumblers, jugs, old spoons, and bottles. These can be ordered according to capacity, thereby reinforcing your earlier work on putting objects in order. They also learn the comparison of the objects according to size, length, and height.

When you introduce students to coins and notes on pages 120-125, have ready specimens of each type of coins and notes in current use. One activity is indicated on page 120; students can also be asked to arrange their coin rubbings into designs and pictures. Use your coins to 'play shop', an activity all students love. Some simple addition and multiplication exercises using coins have been given, and you might like to develop your own subtraction and division games with money if you feel your students are ready for these.

Telling time is a tricky job, especially for kids. As a teacher you can make learning how to tell time a fun activity by making clocks with your students using chart paper. Involve the students in this activity. Once the clocks are made, you can start teaching them the different blocks of time. Before starting your lesson make sure that the students can count up to sixty correctly and they can count by 5s also. Make them familiar with analogue and digital clocks by showing them real clocks. In grade 1 they will learn to read o'clock or half past time.

They are already familiar to a calendar. They know the names of the days and months. Now they will learn to identify the day and date against some given date and day respectively. Emphasise the importance of a calendar by telling them that it keeps us organised and helps in planning an event, scheduling a meeting, or knowing the special days.

Geometry

Knowledge of shapes helps students identify and organise visual information. It enhances skills in other areas including reading, maths, and science. Learning shapes also helps students understand other signs and symbols. In fact, understanding shape helps in cognitive development. Knowing shapes are important because it has applications in everyday life, present around us everywhere. They will study regular 2D shapes and their number of sides, 3D shapes and their number of faces.

At this level students learn to identify and develop patterns with objects and shapes.

The ability to recognise and create patterns help students make predictions based on observations. This is an important skill in mathematics. Patterns allow us to see relationships and develop generalisations. There are two main types of maths patterns: number patterns, or sequences of numbers arranged according to a rule or rules, and shape patterns.

The key idea of position at level 1 is that the position and movement of an object can be described, using the terms over and under, far and near, and right and left. At grade 1, students are developing an awareness of the position of an object in relation to another object. They will be using everyday language to describe where something is in relation to other things, for example 'in front of ...' 'to the left of ...' and so on.

Developing a Positive Attitude Towards Mathematics

Students are born with a mind which is thinking, receptive and ready to try out new things, so they have a vast potential to grow. The two most essential aspects for this growth are the two Rs, i.e. reading and (w)riting, and both of them are dependent on each other.

The primary objective of the New Countdown series is to ensure that every student develops a strong affinity towards mathematics. For this, the following things are necessary:

- Concentration
- A sense of fun
- Retentive memory

- Asking questions and giving answers with confidence
- A sense of discovery and learning (rather than 'being taught')
- Understanding of the subject in a creative, logical and lateral manner
- Individual, easy pace of learning for each student
- A sense of confidence
- A sense of being supported by the teacher

Teachers need to take the age group of the students into consideration and help them learn in a manner suitable to their age.

The first four years in school aided by Starter, Primer A, Primer B and Book 1 of New Countdown have been very useful in exposing students to new things and new ideas in mathematics. At the end of these four years, their power of grasping new topics has improved, they are familiar with the beginnings of the two Rs, and they are ready to accept a lot more.

Building Concentration

A student cannot perform well in the classroom if she/he is not attentive, distracted, or facing difficulty in focusing on the work on hand. Concentration or attention enhances students' understanding and retention. Mostly students will concentrate on fun activities, but it is crucially important to concentrate on all kinds of tasks done in the classroom to improve learning and build confidence. Given below are some strategies to enhance the concentration span in the classroom.

- Set an appropriate amount of time to complete the task. This may bind a student to focus on the given task so that he\she could complete it within time limits.
- Divide big task into parts. As shorter amount of time and one task at a time may become an easier job for the students. A big task requires a longer time and more concentration and focus that may become a reason for distraction.
- Give them enough physical activity to avoid restlessness and make it easier to focus on the task.
- Allow some free time before beginning a new task.
- Reinforce positive behaviour.
- Introduce a reward system by praising the students or allowing them time to read their favourite book.

Some games may be helpful to increase concentration span:

- Just Sit: This game is played by challenging the students to sit in their chairs without moving to see how long they can do it.
- Statue: The teacher says 'statue' and everyone will be still in whatever position they are, for a few minutes.

Like any skill, concentration can be built and improved with consistency.

Memory Retention and Fun

All learning needs to start with practical activities. This makes learning enjoyable and fun-filled. Such an approach also goes a long way to aid memory retention. Rote learning, at most uses two senses—listening and seeing (reading), whereas activities which involve touching create a sense of joy or pleasure at discovering new things, which is missing in rote learning, are a great accelerator for learning.

The greater the number of senses used during a learning exercise, the better will be the concentration and subsequent understanding, retention and application. The joy that students derive out of such a learning experience would be an added bonus.

Formal textbook learning leads to vertical learning, such as 2 + 1 = 3, therefore 3 + 1 = 4 and so on.

Nowadays, it is important that students think, learn and apply their knowledge laterally, i.e. they are actually able to apply the concepts learnt by them to their environment throughout the day.

Any aspect of learning done with concentration will lead to retention and the use of memory can never be undermined.

Discovering, Learning and Understanding the Concept

Students learn something new every minute as they discover. Each discovery is a result of a practical activity and without practical activity a proper grasp of the subject is not possible.

A student may recite a poem-like 1 + 1 = 2, 1 + 2 = 3, and so on. But, unless these numbers are connected to the physical world by presenting the above sums as, say, '1 marble put together with 1 more marble gives 2 marbles' and '2 marbles put together with 1 more marble gives 3 marbles', the entire number sequence makes little sense.

After a start like this, the student's sense of curiosity will be heightened and will remain with him/her throughout life, lending it a dimension that many adults have never experienced.

Lateral Thinking

In today's times, more than ever before, it is important that students think, learn to think and apply their knowledge laterally, i.e. they apply what is actually learnt from the books in the classroom to their environment throughout the day in their every-day life. For example, number families, such as 1, 2 and 3; 2 + 1 = 3, and 3 – 1 = 2 or 3 – 2 = 1, are not only learnt for the classroom but to apply in their daily life as:

'I need 3 books to give as a gift to my friends. I have 2 books at home. So I need to buy 1 book (3 – 2) more.'

From New Countdown students may learn 1st, 2nd, 3rd…up to 10th, but if the lesson has been creatively handled when a situation arises involving 20 students in a line a student with a developed lateral power of thinking will apply 11th, 12th, 13th, and so on automatically. So, observation and vocabulary improve, leading to a major jump in learning.

Asking Questions and Giving Answers

The mother of a well-known intellectual said that the reason for her son's brilliant performance in life was that he always asked too many questions and gave answers, even when he was not asked. Can one say more? A good teacher is the one who encourages students to ask questions and give answers and also gives them a chance to find solutions to different situations whenever possible.

Pace of Learning

Every child learns at a different pace. They do their work at a pace which is comfortable for them. Letting students do at their own pace may affect the unified progression of lessons for all the students in the class. The following strategies can be considered to manage the pace of learning:

- Use a timer in the class. Ask students a question, give sufficient wait and think time. Set the timer and tell the students that as the bell rings, the think time will be over and they will have to give the answer.
- Make clear goals. The students should clearly know what they are going to learn.
- Materials should be ready beforehand.
- Take out time and see where your students are during the lesson. Students enjoy pairing and sharing.
- Break the activity after five to seven minutes, and allow a few minutes to talk and share the information with their partner.
- Use non-verbal quickies like thumbs up and thumbs down to assess if more time is needed.

Building Self-confidence

Being in a familiar and friendly environment itself is a confidence-building exercise. The more relaxed and confident a student is, the easier it is for him or her to absorb new concepts as the year progresses.

Bonding with the Teacher

Students are born with a mind which is thinking, receptive, and ready to try out new things, so they have a vast potential to grow if handled properly by the teacher. A happy and fun-filled atmosphere, which the teacher creates, leads to a greater bonding between the students and the teacher. This is very important at the primary levels and should never be ignored. A comfortable, tension-free atmosphere leads to healthier mental growth. What else could be a better reward for a teacher than a class full of happy and confident students?

Features of the Teaching Guide

The Teaching Guide contains the following features.

Suggested Time Frame

Timing is important in each of the lesson plans. The guide provides a suggested time frame. However, every lesson is important in shaping the behavioural and learning patterns of the students. The teacher has the discretion to either extend or shorten the time frame as required.

Learning Curve

It is important to highlight any background knowledge of the topic in question. The guide will identify concepts taught earlier or, in effect, revise the **prior knowledge**. Revision is essential, otherwise the students may not understand the topic fully.

The initial question when planning for a topic should be how much do the students already know about the topic? If it is an introductory lesson, then a preceding topic could be touched upon, which could lead on to the new topic. In the lesson plan, the teacher can note what prior knowledge the students have of the current topic.

Each topic is explained clearly by the author in the textbook with detailed explanation, supported by worked examples. The guide will define and highlight the **specific learning objectives** of the topic. It will also outline the learning outcomes and objectives.

Real-life Application

Today's students are very proactive. The study of any topic, if not related to practical real-life, will not excite them. Their interest can easily be stimulated if we relate the topic at hand to real-life experiences.

Frequently Made Mistakes

It is important to be aware of students' common misunderstandings of certain concepts. If the teacher is aware of these they can be easily rectified during the lessons. Such topical misconceptions are mentioned to support teachers.

Summary of Key Facts

Facts and rules mentioned in the text are listed for quick reference.

Model Lesson Plan

Planning your work and then implementing your plan are the building blocks of teaching.

Teachers adopt different teaching methods/approaches to a topic.

A model lesson plan is provided in every unit as a preliminary structure that can be followed. A topic is selected and a lesson plan written under the following headings:

Topic

This is the main topic/sub-topic.

Duration

Suggested duration is the number of periods required to cover the topic. Generally, class dynamics vary from year to year, so flexibility is important. The teacher should draw his/her own parameters, adjusting the teaching time depending on the receptivity of the class to that topic. Note that introduction to a new topic takes longer, but familiar topics tend to take less time.

Specific Learning Objectives

This identifies the specific learning objective/s of the sub-topic being taught in that particular lesson.

Key Vocabulary

List of mathematical words and terms related to the topic that may need to be pre-taught.

Resources

This section includes everyday objects and models, exercises given in the chapter, worksheets, assignments, and projects.

Strategy

Starter: Engagement Activity

The lesson can begin with something interesting, such as telling a story, relating a real-life experience or an everyday event which may or may not lead to the topic; but is interesting enough to capture the attention of the students. Involving students in a discussion to find out how much knowledge they have of the topic being taught is also a good strategy. Teachers can use their own creativity to come up with ideas to create a sense of fun.

Main Developmental Activity

Learning needs to start with practical activities, therefore the main developmental activity is the first step that leads to actual learning, which in turn leads to the required outcome of the lesson. This activity can be planned as individual work, pair or group work as required. Working individually creates self-confidence where the student enjoys a sense of self-achievement, whereas pair and group activities create a sense of discovering and learning together.

These activities enhance concentration and improve retention. Through these activities you can build understanding of concepts in a fun-filled way. It is easier for student to grasp the concepts and then move from abstract to concrete.

Written Assignments

Finally, written assignments can be given for practice. It should be noted that classwork should comprise of sums of all levels of difficulty, and once the teacher is sure that students are capable of independent work, homework should be handed out. For continuity, alternate sums from the exercises may be done as classwork and homework.

Supplementary Work (Optional) An activity or assignment could be given. It could involve group work or individual research to complement and build on what students have already learnt in class.

The students will do the work at home and may present their findings in class.

Wrap up

At the end of a sub-topic, wrap up should be done using various strategies. For example, a quick question and answer session involving the whole class. Challenging student with a question to check their understanding of the concept taught is another useful strategy.

Suggested Activities

Activities and assignments are suggested to perform individually, in pairs, and in groups. Flash cards based on the concept being taught will have more impact.

1 Getting Ready

Unit 1 is based on a conscious emphasis on *review*, on ensuring that the concepts presented in the beginner-level books are well understood and fresh in the student's mind. When reviewing *comparison*, make sure you have plenty of objects at hand for the student to work with buttons, pebbles, beads, pencils, candles, twigs and even leaves can be used to help students grasp such ideas as ‘big’, ‘bigger’, ‘biggest’ or ‘short’, ‘shorter’, ‘shortest’; they are also useful for the type of exercise shown on pages 147. You can arrange groups of students according to height (better still, get the other members of the class to do the arranging); and, of course, running races are an excellent way of teaching ordinal numbers (‘Which student came first, which came second and so on).

In this section, students will also learn that the concepts of ‘greater than’, ‘less than’ can be shown by a simple symbol. To reinforce the point, make own giant crocodile’s head out of thick cardboard, and highlight the open jaws with a strong, bright colour.

Revision of shapes can be done through objects in the classroom. Addition and subtraction on a number line and by counting objects will help students to recall the methods already learnt and consequently apply their skills on advanced methods. The concept of zero has been taught to them. A thorough revision should be done using everyday happenings.

Suggested Activities

Count and Colour

Whole Class Activity (10 minutes)

Make two types of flash cards one with numbers and other with objects. (Take random numbers and make enough flash cards to cater to the number of students in your class). Take them outside in the school garden and give each students a card with a number or the objects. Each student needs to find his/ her corresponding partner e.g. the student with the flash card of number 15, needs to find the student with the flash card of quantity 15.

Small Group Activity (10 minutes)

Divide students in groups and provide them with disposable glasses. Label each glass with a number (take random numbers) and give at least 8 glasses to a group. Also

provide counters/ beads to them. Ask them to paste counters/ beads on the glasses according to the number written on the glass.

Individual Activity (10 minutes)

Circulate the basket of flash cards of numbers and object cards that were used in the whole class activity. Ask each student to pick a number card and find the matching object card.

Individual practice of matching the number with the quantity of objects can also be done through counters/ beads and disposable glasses that were used in small group activity.

Shapes

Whole Class Activity (5 minutes)

Reinforce 3D shapes with edges and vertices through geometrical solids. Pass the solid to each student and let him/ her feel and recognise its edges and vertices by touching the solid first with open eyes and then with closed eyes.

Individual Activity (5 minutes)

Mystery Game - Prepare a feely bag and put all the introduced solids in it. Let students take turns to touch and feel any solid by putting their hands inside the feely bag and naming it, without seeing it. Let them take out the solid to check if they guessed it right or not.

Group Activity (5 minutes)

Divide the class in 5 groups. Provide each group laminated templates having pictures of a 3 D shape one side and the name of the shape on the other side Provide each group a worksheet with a list of 3 D shapes and their names in a way not matching each other. Each group will refer to the laminated sheet and match the shapes with their names.

Addition

Whole Class Activity (10 minutes)

Make a number line in the classroom. Write any addition sum on the board e.g. 5 + 4 =. Let students keep their finger on the first number written on the number line i.e. 5. Now ask them to see the next number and move the finger forward according to it. Now let them move the finger four steps forward while counting from 1 till 4. Tell them that the last number i.e. 9 is your answer. Practice a lot of sums in the same way. Involve different students each time

Small Group Activity (8 minutes)

Prepare some laminated templates of number lines on A4 sized papers. Also prepare some ready-made paper slips of addition sums (4 to 5) on them. Divide the class in groups. Let the students practice addition sums as they did in whole class activity using board markers. The group who will do all sums correctly in a shorter span of time will be the winner.

Individual Activity (10 minutes)

Give individual practice to the students for addition sums. Use the same ready-made paper slips of addition sums that were used in small group activity. Let students solve addition sums using number line. Also give them practice to solve the sums mentally.

Subtraction

Whole Class Activity (10 minutes)

Draw a number line on the board in the classroom. Write any subtraction sum on the board e.g. 5 – 4 = ___. Let students keep their finger on the first number written on the number line i.e. 5. Now ask them to see the other number and move the finger backward according to it. Now let them move the finger four steps backward while counting from 1 till 4. Tell them that the last number i.e. 1 is your answer. Practice a lot of sums in the same way. Involve different students each time

Small Group Activity (5 minutes)

Prepare some laminated templates of number lines on A4 sized papers. Also prepare some ready-made paper slips of subtraction sums (4 to 5) on them. Divide the class in groups. Let the students practice subtraction sums as they did in whole class activity using board markers. The group who will do all sums correctly in a shorter span of time will be the winner.

Individual Activity (5 minutes)

Give individual practice to the students for subtraction sums. Use the same ready-made paper slips of subtraction sums that were used in small group activity. Let students solve subtraction sums using number line. Also give them practice to solve the sums mentally.

Making 10

Whole Class Activity (10 minutes)

Let the students take ten counters and make different combinations with them. Guide them to follow the number sequence from 0 to 9. For example, let them take 0 counters and ask them how many counters are needed to make 10. Then let them take 1 counter and ask them how many more counters they need to make 10. Let them continue making combinations up to number 9. Each time they give you the correct combination, write the equation on the board. For example, 0 + 10 = 10, 1 + 9 = 10 and so on.

Also give them practice to subtract different numbers from 10, following the sequence from 0 to 9. For example, 10 – 0 = ___, 10 – 1 = ___ etc.

Small Group Activity (10 minutes)

Let students follow the same method as in whole class activity and make 10 with different combinations using the counters. Ask them to record those combinations on papers. Later let them practice making combination of 10, without using the counters.

Also give them practice to subtract different numbers from 10, following the sequence from 0 to 9. For example, 10 – 0 = ___, 10 – 1 = ___ etc.

Individual Activity (10 minutes)

Once the students are well aware of different combinations of 10, give them the equations with a number missing in between, for example, ___ + 6 = 10, ___ + 10 = 10 etc. Let them practice such sums with different combinations.

Give similar practice for subtraction sums.

Comparison

Whole Class Activity (10 minutes)

Take students outside the classroom. Let them observe different big and small, long and short and tall and short objects in the surroundings. Bring them back to the class and ask them to list down the names of at least one big, one small, one long, one short, and one tall object that they have observed.

Small Group Activity (8 minutes)

Divide students in 4 to 5 groups. Let each group collect 3 big and 3 small objects from the classroom and keep both big and small objects separately on the table. The group who will collect all 6 items correctly will be the winner.

Arrange same activity for the concept of long and short and tall and short.

Individual Activity (10 minutes)

Ask students to draw the concept of big and small/ long and short/ tall and short on papers. Display their drawings in the classroom and let students have a gallery walk to see the drawings of their peers

2 Numbers

Suggested Time Frame

8 to 10 periods

Learning Curve

In the previous class the students have learnt to count and write numbers up to 50 in words and numerals. They learnt to identify the numbers before, between, and after the given numbers. They can also compare and order a given set of number. The concept of 0 as a place holder is brought in at this level.

In Unit 2 they will learn counting, reading, and writing numbers up to 100. The number sequence revises the learning of ascending order ,descending order, greater than, smaller than, and use of symbols (<) and (>) with two digit numbers. Earlier, students have learnt skip counting in 10s. In this unit, they reinforce their knowledge of skip counting and count in 2s beginning with an even number and then with an odd number.

They will learn the ordinal numbers up to 10.

Real-life Application

We use numbers in time, date, year, and months. Numbers are used at home, in school, in the playground, and for the addresses of the houses. They are found on phones, TV channels, and in books as page numbers. Doctors use numbers in their medicine doses and results of laboratory tests. In fact, they play a major role in our lives. Engineers use them in the planning of buildings, bridges, high scrapers, and different types of machines.

Frequently Made Mistakes

The students tend to make the following mistakes frequently:

- When they convert the ones into tens.
- Skip the numbers while counting the objects.
- They get mixed up in ascending and descending order.

Summary of Key Facts

- Numbers can be represented in words and figures.
- A number is a mathematical term used to count, measure, estimate and label.
- Zero is defined as a number.
- The actual value of numbers is determined by their placement in a place value chart.
- Numbers can be compared, ordered in ascending and descending manner, and counted backward.
- There are symbols to show greater and smaller numbers.
- Ordinal numbers are used in positioning the objects.

Model Lesson Plan

Topic

Comparison of two digit numbers

Duration

80 minutes

Specific Learning Objectives

By the end of the lesson, students shall be able to:

- compare two or more sets of objects in terms of their numbers.
- differentiate between the terms greater than, smaller than, and equals to.
- identify more, less ,or equal numbers in a set of numbers.
- identify greater and smaller numbers on a number line.
- use symbols for greater than (>) and smaller than (<).

Key Vocabulary

count, match, compare, group, greater than, smaller than, more, less, and number line

Resources

A basket full of pebbles of equal size,

A puppet crocodile with open mouth,

A number line on the board

A number square on the board

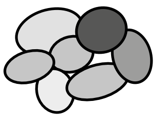
Strategy

The students should have a prior knowledge of the relationship between numbers and quantities. They already learnt the concept of bigger and smaller to compare the size of objects.

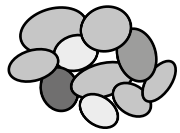
Now, give them a verbal description of bigger and smaller numbers relating to the quantities with the help of materials like beads, pebbles, or small stones.

Engagement Activity (10 minutes)

Heap two different numbers of pebbles or beads on the table. Ask them to identify the greater quantity without counting. Obviously the bigger heap will have the greater number of pebbles.



7 pebbles



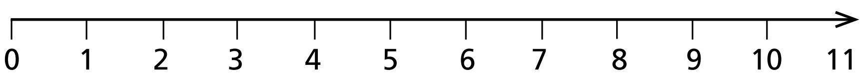
10 pebbles

The bigger heap has the greater number of pebbles; i.e 10 is greater than 7

Explain the idea using a number line.

Main Developmental Activity (40 minutes)

Draw a number line. Taking different numbers on the number line, tell the students that a number closer to zero is smaller than a number farther from zero. Give the students a few examples on the number line, like 7 and 11.



7 is closer to zero as compared to 11 which is farther from zero. Hence, 11 is greater than 7 or 7 is smaller than 11.

Give similar examples to enhance students' understanding.

A number strip can also be used in place of a number line.

At this stage you can introduce the symbols of greater than (>) and less than (<) by using a common yet interesting activity of a hungry crocodile. The open mouth of hungry crocodile is always towards the greater number. Therefore, 7 < 11 or 11 > 7

Written Assignment (20 minutes)

Classwork: Exercises on pages 44 and 45

Homework: Exercise on pages 46, and 47

Wrap up (10 minutes)

A quick thumb up and thumb down activity can be done in the class. Write two numbers on the board and put a greater than or smaller than symbol between them. Ask the students, if they think the symbol is correctly placed to make their thumbs up and who think the symbol is wrong to make their thumbs down. By this activity you can point out, at a glance, the students who are giving the wrong answers. This activity should be reinforced three to four times for enhancement of understanding.

Suggested Activities

Starter Activities

Whole Class Activity (10 minutes)

Use drinking straws or pencils to represent tens. Count ten straws/ pencils in front of the students and tie those ten straws/ pencils with a rubber band. Tell students that this is 1 ten. Show them the number card of 10, telling them that this is 1 ten. Along with 1 ten pick up one more straw/ pencil and keep it with the ten saying that this is 10 (pointing towards 10) and this is 1 (pointing towards the single straw/ pencil). Now say that '10 and 1 make 11. Let students repeat after you.

Whole Class Activity (10 minutes)

Use drinking straws or pencils to represent tens. Count ten straws/ pencils in front of the students and tie those ten straws/ pencils with a rubber band. Tell students that this is 1 ten. Show them the number card of 10, telling them that this is 1 ten. Now make one more set of ten straws/ pencils, keep both sets together and tell students that these are 2 tens. Show them the number card of 20 with it. Similarly make tens till 90 and show them along with the cards

Small Group Activity (10 minutes)

Provide eighteen sets of tens (made up of pencils/ straws) to the students along with 45 loose pencils/ straws. Also provide them the number cards from 21 to 29. Let them arrange the number cards from 21 to 29 in sequence on the floor. Now guide them to put the required numbers of bundle of tens and loose straws/ pencils next to the number cards.

Whole Class Activity (5 minutes)

Show students a three-picture sequence such as opening a tin of dog food, putting the food in the dog bowl and the dog eating from the bowl. Using the middle picture, ask students which picture shows what happened before. Use the third picture to introduce after. Discuss other picture sequences using before, after and between to order each sequence.

Whole Class Activity (10 minutes)

Introduce the concept of greater/ numbers with the help of counters. Keep smaller quantity of counters on one side and a bigger quantity on the other side. Let students count and tell about the greater/ lesser quantity. Also introduce the crocodile's mouth for greater numbers.

Main Developmental Activities

Whole Class Activity (10 minutes)

With the continuity of first starter activity, introduce all numbers till 19 in the similar way. Show how 2-digit numbers have tens and ones, writing O above the ones and T above the tens.

Small Group Activity (10 minutes)

Give number cards (11 to 19) to the students. Let students display number cards in sequence and then make the quantity using tens and ones (straws/ pencils) in front of those number cards, as displayed in the whole class activity.

Individual Activity (10 minutes)

Provide laminated templates to the students for practising the placing of tens and ones. Refer to pages 16 to 20 and make a similar kind of template. Let students use a board marker to work on those templates.

Small Group (10 minutes)

Fix a washing line in the classroom. Provide the group with the number cards of all tens (10 to 90) in a basket. Let them practise sequencing the tens on the washing line. Ask them to show you the sequence once they complete it.

Individual Activity (8 minutes)

Provide laminated templates to the students for writing the tens in ascending/ descending order (refer to page 47) and completing the number chain (refer to page 25).

Also let them have individual practice of sequencing tens from 10 to 90 on the washing line.

Whole Class Activity (8 minutes)

Once the concept of teens and tens is understood, pick up two sets of tens (made up of pencils/ straws). Ask students how many tens are they (two). Along with two 10s (2 sets of 10 straws/ pencils) pick up one more straw/ pencil and keep it with two 10s saying that these are two 10s (pointing towards two 10s) and this is 1 (pointing towards single straw/ pencil). Now say that two 10s and 1 make twenty-one, let students repeat after you. Also show the number card of 21. Introduce all numbers till twenty-nine in a similar way.

Follow the same methodology for introducing all series of numbers (31-39, 41-49, 51-59, 61-69, 71-79, 81-89, and 91-99).

Once all numbers are done till 99, show ten sets of 10s (made up of pencils/ straws) to the students. Tell them that ten 10s make a hundred. Show them the number card of 100.

Individual Activity (10 minutes)

Fix a string in the classroom. Provide the group with the number cards from 21 to 29 in a basket. Let them practice sequencing the numbers on the string. Ask them to show you the sequence once they complete it. Repeat the same procedure with all other number series (31-39, 41-49, 51-59, 61-69, 71-79, 81-89, and 91-99).

Small Group Activity (10 minutes)

Chit Game - Prepare chits with any one number written on each chit. Fold all chits and put them in a basket. Let students sit in a circle and sing a song and as they sing the students can pass the basket around the circle. When you stop them from singing the student holding the basket will pick up a chit, open it and let others know which number is written on the chit. The teacher will now ask the same student to tell which number comes before/ after.

Same game can be played for ‘between numbers with different chits having numbers like 22 — 24 etc.

Individual Activity (5 minutes)

Provide different laminated templates to the students to practice before, after, between, greater, and lesser numbers. Refer to pages 41 to 46 for making the templates.

Whole Class Activity (10 minutes)

Take the students outside the classroom and distribute enlarged number cards to each student randomly for example 21, 11, 30, 69, 58, 43. Ask the students to arrange the number cards in ascending and descending order on the floor.

Small Group Activity (10 minutes)

Provide playing blocks to the students with different numbers written on each block with a permanent marker e.g. 33, 50, 41, 90, 86, 77 etc. (take 10 to 15 blocks at least). Ask them to build a tower with those blocks in ascending or descending order.

Individual Activity (8 minutes)

Give individual practice to the students for ordering numbers in ascending or descending order using number cards and blocks. Also provide them laminated templates to arrange numbers in ascending or descending order using a board marker. Refer to page 47 of New Countdown Book 1 for making the template.

Whole Class Activity (15 minutes)

Take students outside the classroom and divide them into groups of ten. Each group will have a race in the ground. After the race of one group is finished, write the positions (1st till 10th) on the students' hands using marker. Repeat the same procedure with other groups. First three winners (1st, 2nd and 3rd) of each group will again have the race and winner will be finalised. (PE period can be utilised for this activity).

Small Group Activity (10 minutes)

Make the same groups of ten students as made for the race. Ask the students to remember their position in the race. Give spelling cards of ordinal numbers (first till tenth) to each group. Ask them to read the spelling cards and each student to keep the relevant spelling card with him/ her. For example, the student who stood 1st in the race would keep the spelling card of ‘first’ with him/ her, the one who stood 2nd would keep the card of ‘second’ and so on. Once they have the relevant cards, they will stand in a row according to their positions (first till tenth), holding the spelling cards in their hands.

Individual Activity (10 minutes)

Provide ten multicolour ring crackers to each student; 2 yellow, 2 pink, 2 blue, 2 orange and 2 green. Also provide a string to them. Write the positions of the crackers on the board. For example, yellow – first, pink – second, orange – third, green – fourth, blue – fifth, yellow – sixth, pink – seventh, orange – eighth, green – ninth, blue – tenth. Let students pass the thread through the crackers according to the given position.

3 Addition

Suggested Time Frame

8 periods

Learning Curve

The students already have the concept of addition by making one more and two more through counting of objects. They can do single digit addition through pictures and numbers. They can perform single digit addition using number line also. They have the idea of addition with 0. They are able to make stories of 10. They are familiar with the symbols of + and =.

In unit 3 students will practise using symbols of addition and equality. At this level they will learn to add two-digit numbers with one-digit numbers and addition of two digit numbers with 10s. They will learn addition of two two-digit numbers and three two-digit numbers. They will identify the missing numbers that sum up to 20. They will be guided to develop mental maths strategies and encouraged to solve real life problems involving addition.

Real-life Application

Basic addition has been with us from infancy. Addition is the term used to describe adding two or more numbers together. The skill to 'add up' is important in all aspects of life. We can use addition to solve subtraction problems because subtraction is the inverse operation to addition. As students build understanding about addition it is important that they associate their knowledge with daily life experiences like:

- number of family members and friends
- number of toys, dresses, books, shoes, and different objects around them
- counting small amount of money they have as their savings
- using their fingers for adding subtracting two numbers

Frequently Made Mistakes

- Writing numbers incorrectly.
- Unable to represent numbers along a straight line, vertically under appropriate place value.
- Writing wrong numbers as a result of carelessness.

Summary of Key Facts

- Numbers can be compared using operation of addition.
- Symbols used for addition and equality are + and = respectively.
- Number line can be used for comparing and adding the numbers.
- Addition equations are constructed to find the total or missing number in an addition sum.
- Numbers are commutative with respect to addition i.e. numbers can be added in any order.
- When we add 0 to any number, the number remains the same.
- When 1 is added to any number, the sum is the next number.

Model Lesson Plan

Topic

Addition of two digit numbers

Duration

80 minutes

Specific learning objectives

By the end of the lesson, students shall be able to:

- add 2-digit numbers with 10s.
- add two 2-digit numbers without carrying forward.

Key Vocabulary

add, compare, vertically, horizontally, group, up to, how many, altogether, more, sum, answer, abacus

Resources

- Fishing game (prepared by the teacher by cutting out the fish from chart paper, sticking a jam clip at one side of the fish and a rod tied with a magnet at one end)
- A fish bowl

Strategy

Teaching addition to small student follows the following pattern:

- Concrete objects
- Pictures only
- Pictures and numbers
- Numbers

Once the students are able to deal with numbers, they move from horizontal calculation to vertical calculation and then to story sums and word problems.

Students love stories. If the real-life situations are told to them as stories, they pick them with better understanding level. They also love to make their own stories.

Engagement Activity (10 minutes)

You can start with the fishing game, making a story as given below:

'I had 5 fish in my fish bowl. On my birthday, my friend gave me three more fish. How many fish do I have now?' Ask the same question with different numbers of fish.

Main Developmental Activity (40 minutes)

In a fish bowl you will drop 5 fish and then 3 more fish. Now you will count by taking them out one by one with the help of a magnetic rod. Now there are 8 fish altogether. The key word 'altogether' should be emphasised and explained here. Numbers will be chosen according to age level. If they sum them correctly, it means they have understood the concept clearly. Repeat the activity several times by calling students to perform on their own.

Adding two digit numbers with 10s can be easily taught by using some straws. Make two bundles of 10s with straws along with some loose straws. Now write 10 + 12 on the board. Place one bundle of ten straws on the table. Take another bundle and add two more to make it 12.

Now you have two tens and two ones making the sum 22. Write a few sums on the board.

12 + 14, 10 + 9, 10 + 11, and 15 + 16

Divide the class into four groups. Call the groups one by one to find the sums using straws.

Written Assignment (20 minutes)

Sums on page 56, 57, and 59 can be given as classwork and homework.

Wrap up (10 minutes)

Make a quick round of questions making sums with 10s like ten plus six, ten plus four, ten plus eight, and so on.

Suggested Activities

Starter Activity

Whole Class Activity (10 minutes)

Provide counters to the students and ask them to pick up different combinations of two counters and count altogether (write the combinations on the board). Make sure that the answer of the sum each time is a 2-digit number e.g. 4 + 8, 6 + 4, 5 + 5 etc.

Main Developmental Activities

Whole class activity (10 minutes)

Let students add sums horizontally with one Tens and one Ones number e.g. 16 + 3 = Guide them to solve the sum mentally. Ask them to keep the bigger number i.e. 16 in their minds. Then ask them to take out their fingers according to the other number i.e. 3. Now ask them to count after the number which is in mind i.e. 16. Close your fist and open your fingers one by one while counting and saying 17, 18, and 19. Say 'the answer is 19'. Give a lot of practice of adding numbers mentally.

Also give them the practice to solve addition word problems.

Individual Activity (10 minutes)

Prepare lots of laminated templates of different types and keep them in the classroom for students to practice different addition sums using board markers. Refer to pages 56 to 70 to make different types of templates. Let students practice these templates in pairs or small groups.

Individual Activity (10 minutes)

Give a lot of individual practice to the students for solving addition sums using the laminated templates (same templates which were used in small group activities) of different types, as and when they get the time.

4 Subtraction

Suggested Time Frame

8 to 10 periods

Learning Curve

The students have learnt the concept of one less through objects. They have learnt single digit subtraction through pictures, numerals, and on a number line. They have been given the concept of subtraction with zero. They are familiar with the use of symbols – and =.

In this unit they will learn to find how much a number is smaller than another number. They will learn to subtract one and two digit numbers without borrowing. They will be able to find a missing number in a subtraction sum.

Real-life Application

Subtraction is a part of our daily life. We use subtraction when dealing with money, travelling, cooking, and many other daily experiences. Some real-life experiences can be:

- going to the shop and buying something
- borrowing something
- lending something
- giving discounts

Summary of Key Facts

- Subtraction is removing some objects from a group.
- If zero is subtracted from a number, the result does not change.
- Any number subtracted from itself results in zero.
- For subtraction we count back.

Frequently Made Mistakes

- Writing down the wrong numbers or performing the wrong operation, as a result of carelessness.
- Error in recalling basic number facts.
- Not knowing how to proceed and providing random responses.

Model Lesson Plan

Topic

Subtracting tens from two digit numbers without borrowing

Specific Learn Objectives

By the end of the lesson students will be able to:

- Subtract tens from two digit numbers.
- Subtract a two digit number from another two digit number.

Duration

80 minutes

Key Vocabulary

subtract, minus, take away, smaller or greater, compare

Resources

Grid chart 1 to 99, objects in group of tens

Strategy

Engagement Activity (10 minutes)

Display an empty number grid chart 1 to 99 on the board. Ask the students to count the numbers backwards from 99 to 1 and keep on filling the grid.

Main Developmental Activity (40 minutes)

Now the teacher moves step by step from 10 and goes up to 20 and its family from 20 to 29, followed by 30 and its family up to 39, and so on till 99. All this facilitates working with subtraction sums.

Take three bundles of 10 straws and ask them how many straws they are, as they have already learnt counting in tens. Now take one bundle away and ask how many bundles are left. There will be two bundles left. Tell them it makes 20. Explain the same result on number grid by colouring numbers 1 - 30. Show them that 30 makes three groups of 10s. Now cross out the numbers counting backwards from 21-30. Tell them that left over numbers are 1-20 i.e. two groups of tens. Tell them that subtracting tens from tens is as easy as subtracting two one digit numbers. We only have to write zero on the ones place.

After repeating the subtraction of tens several times, you can proceed to the subtraction of two digit numbers.

Start with the same straws, this time you will take some loose straws also to make numbers with tens and ones. Suppose you take one set of two tens and two loose straws making 22 and another set of one tens and one loose straws making 11. Now colour 1-22 on the number grid. Cross out 11 grids counting backwards from 22. The remaining grids will be the result.

Subtraction can be done on an abacus also. Suppose 25 is subtracted from 47. Display 47 on abacus putting 7 beads on the ones place and 4 beads on the tens place. Now take out 5 beads from ones place and 2 beads from tens place leaving 2 beads on the ones place and 2 beads on the tens place making 22.

A great deal of physical subtraction of 2-digit numbers is required with all the aids (using the objects in groups of 10 and ones) before working in the notebook.

Written Assignment (20 minutes)

Sums on pages 74-77 can be given as classwork and homework.

Wrap up (10 minutes)

Distribute a number grid made on a sheet of paper to each of them. Write three or four subtraction sums on the board according to the number of rows in the class. Assign one question to each row and ask them to solve it on the number grid. Discuss the answers in the class.

Suggested Activities

Starter Activity

Whole Class Activity (10 minutes)

Provide counters to the students and ask them to pick up different combinations and subtract (write the combinations on the board). Make sure that the answer each time is a 2-digit number e.g. 15 - 4, 10 - 0, 16 - 2 etc.

Let students subtract horizontally a 1-digit number from a 2-digit number for example, 12 – 7 = ____.

Guide them to subtract mentally. Ask them to count after 7, till 12, opening their fingers one by one as they count 8, 9, 10, 11, 12. Let them count their opened fingers and say the answer is 5. Give a lot of practice of subtracting numbers mentally.

Main Developmental Activities

Whole Class Activity (20 minutes)

Write a sum vertically with one tens and one ones number along with ‘T’ and ‘O’ written on top of the numbers for Tens and Ones.

$$\begin{array}{rcc} & T & O \\ & 1 & 5 \\ - & & 2 \\ \hline \end{array}$$

Guide students to subtract ones and then tens. Ask them to keep the smaller number of ones in mind if the sum is 15 – 2, ask them to keep 2 in their minds. Now ask them to count after the number which is in mind i.e. 2 till the bigger number i.e. 5. Open your fingers one by one while counting and saying 3, 4, 5. Count the fingers that are open i.e. 3 and say 'the answer is 3'. Tell them that there is only one number in tens column so we will copy that number as it is i.e. 1. The answer is 13. Give a lot of practice of subtracting vertical sums mentally.

Also give them the practice to solve subtraction word problems, and the subtraction sums of 2-digit numbers.

Small Group Activity (10 minutes)

Prepare lots of laminated templates of different types and keep them in the classroom for students to practice subtraction using board markers. Refer to pages 71 to 87 to make different types of templates. Let students practise these templates in pairs or small groups.

Individual Activity (10 minutes)

Give a lot of individual practice to the students for solving subtraction sums using the laminated templates (same templates which were used in small group activities) of different types as and when they get the time.

5 Multiplication

Suggested Time Frame

6 to 8 periods

Learning Curve

Earlier, students have learnt skip counting in 10s. In these pages, they reinforce their knowledge of skip counting and count in 2s beginning with an even number and then with an odd number. This leads to multiplication.

The students are able to skip count using the number line. They are familiar with addition. Multiplication can easily be understood if there has been extensive practical work leading to a thorough knowledge of addition.

The students are able to notice groups of objects existing in nature, for example, 1 Sun, 2 arms, 3 wheels in a three-wheeler, 4 legs of a pet, 5 fingers, 6 legs of an insect, leading to man made objects, such as, 8 or 10 pieces of a chocolate slab, etc. They will learn to develop multiplication tables of 2, 3, 4, 5, and 10.

Real-life Application

- We use multiplication in purchasing and billing. We know the price of one unit of a commodity (the price of a bottle of juice, 1 kg of apple, 1 notebook etc) from the packing itself. Then we multiply the price for the required quantity.
- Multiplication is used in counting the value of the currency. First, we count the notes and coin and then multiply with its value to find the total amount.
- If we are travelling with our friends or family we need to buy multiple tickets according to number of people. There we multiply cost of ticket with number of people to find the expenditure on tickets.
- In the kitchen while we are cooking some food we use multiplication for adding spices like one teaspoon in 1 kg so 4 teaspoons in 4 kg.
- Students get pocket money from their parents. They need to plan and make a budget for their daily expenses and multiply with the number of days in the months.

Frequently Made Mistakes

- Times tables not learnt.
- Not adding carried forward numbers.

Summary of Key Facts

- Any number multiplied by zero (0) equals zero.
- Any number multiplied by 1 equals that number.
- Any number multi plied by 2 equals double of that number.
- Multiplication can be explained as repeated addition.
- If we combine 4 groups with 5 objects in each group, the result will be 4 × 5 = 20. We can obtain the same result by adding 5 four times.

  5 + 5 + 5 + 5 = 20
- Any numbers multiplied by 10, shifts one place towards left having 0 at its ones place.
- Multiplication of numbers satisfies the commutative property.

Model Lesson Plan

Topic

Multiplication tables

Duration

80 minutes

Specific Learning Objectives

By the end of the lesson students will be able to develop 2, 3, 4, 5, and 10 times table.

Key Vocabulary

repeated addition, even, odd, group, grouping, multiply, times table, total

Resources

Jar of coins, different objects to make groups or piles

Strategy

For some students it is easier to learn times table than for others, but all students need a helping hand. Learning times tables by heart will make maths much easier for them. Times tables will help in all aspects of school life and daily life. The best order for learning the times table is 1s, 2s, 3s, 4s, 5s, and 10s.

Engagement Activity (10 minutes)

Multiplication is just sequential adding. Take a jar of coins and put three piles of four coins. Explain that you have four coins, three times. This means you have 4 + 4 + 4. It also means you have three times four (3 × 4). If you add up all the piles of coins you will have twelve coins in total. This kind of practice can be done as many times as needed for the student to comprehend the idea of multiplication. Change the quantities and the objects until your students feel confident enough to move on.

Ask the students if there are two pastries in a box, how many pastries will be in seven boxes?

They may give the answer by multiplying or by adding.

Main Developmental Activity (20 minutes)

Introducing the students to the times table. A very easy way is to start with 1s times table i.e. 1 × 1 is 1. Explain that multiplication of any number by 1 results the same number. Following this simple rule they can easily build 1 times table.

With the twos it is just about explaining that we are doubling that number. For example, the sum 2 × 6 also means double of six. Two times six is twelve, two sixes and double of six is twelve.

The times tables can be learnt on a number line with Bobo the bunny. Bobo jumps every time the same number for which the times table is required. Page 97, 100, and 103 in the book will help out the students to learn the tables on a number line. 3s, 4s, and 5s times tables can be easily produced using number line. Students will also enjoy the jumps of Bobo the bunny.

The ten times tables are the easiest to produce as they learn how the tables work. To multiply any number by 10 you simply put a zero on the end of it. Page 106 and 107 provide ample practice of 10s time table to the student

Written assignment (20 minutes)

Sums from Page 95-108 can be given for classwork and homework.

Wrap up (10 minutes)

Give them page 93 and 94 to solve the sums. Check them then and there.

Teach the tricks (20 minutes)

The great thing with times tables is that there are many tricks that can help students memorise them easily. Let's take a look at a couple of tricks.

2 times tables: Double the number.

4 times tables: Double the number and then double it again.

10 times table: write a 0 on the right of the number

Frequent drilling should be done once the students are familiar with the tables. Drilling should be started in order and once you feel they are getting there, you can mix it all up.

Drill sessions should be quite short, no more than about five to seven minutes, depending on the attention span of the age level.

Suggested Activities

Even and Odd Numbers

Whole Class Activity (10 minutes)

Ask ten students to come to the front of the class. Rest of the students will count how many students are standing. Have each student find a partner (since there are 10 students, everyone will have a partner). Write 10 on the board under the word 'even'. Explain to students that everyone has a partner because 10 is an 'even' number. Ask 2 students to sit down, leaving 8 students standing. Everyone should have a partner. Write 8 on the board under 'even'. Repeat this process with 6, 4, and 2 students. Ask students what they think would happen if there were 9 students standing. Would everyone have a partner? Repeat for 7, 5, 3,1. Students should be able to tell you that a student will be left without a partner for 7, 5, 3, and 1.

Small Group Activity (5 minutes)

Draw a chart with two columns and label it "Odd and Even?" Write the numbers 1-12 in the left–hand column. Invite students to take turns rolling a pair of dice. Have the student count the number of dots and say if the number is odd or even, then prompt the class to raise their hands if they agree. Once students have discovered the right answer, write the number on the chart in appropriate column. Remind them that even numbers end in 2, 4, 6, 8 or 0 and odd numbers end in 1, 3, 5, 7 or 9. Continue until you have completed the chart.

Individual Activity (10 minutes)

Provide number cards from 1 to 10 and 55 counters to the students. Let them arrange number cards from 1 to 10 in sequence and place counters below every number card according to the number, making pairs of counters where possible. Provide them a sheet of paper and let them write the numbers that have equal pairs under the heading of even numbers and also write the numbers that don't have equal pairs under the heading of odd numbers.

Times Tables

Whole Class Activity (10 minutes)

Take two counters/ buttons and ask students how many are they. Tell them that today we will count in 2s. Write $1 \times 2 = 2$ on the board. Say 1 time 2 is 2. Take two more counters/ buttons and put them together with the first two counters. Ask the students to count i.e. 4. Write the equation on the board under the first equation i.e. $2 \times 2 = 4$. Say 2 times 2 is 4. Keep adding two counters/ buttons each time until you reach twenty. Each time after adding two counters/ buttons, and ask students to count, write the equation on the board.

Repeat the same procedure for counting in 3s and 4s.

For introducing the counting in 5s and 10s, ask students to count/ their fingers and write the equation each time i.e. $1 \times 5 = 5$, $2 \times 5 = 10$ and $1 \times 10 = 1$, $2 \times 10 = 20$ and so on.

Small Group Activity (10 mins)

Make a number line in class from 0 to 20 and provide students with a laminated template of 2 times table, without the product leaving blank spaces. Let students count in 2s on number line and write the answer on the laminated template with board markers.

Make a number line up to 40 for counting in 3s and 4s and provide templates accordingly.

For counting in 5s, prepare ten small sized flash cards with 5 tiny circles on each card. Provide similar laminated template as of 2s, 3s and 4s. Let student count the dots of one card and write the answer for $1 \times 5 = 5$, then count the dots of two cards and write $2 \times 5 = 10$ and so on.

Make similar ten cards with 10 tiny dots on each card for counting in 10s.

Individual Activity: (10 mins)

Prepare lots of laminated templates of different types and keep them in the classroom for students to practise times tables using board markers. Refer to pages 88 to 110 to make different types of templates. Let students practise these templates as and when they get the time.

6 Division

Suggested Time Frame

6 periods

Learning Curve

Students are familiar with multiplication. Division can be understood if there is a sound knowledge of multiplication to build on and if student have adequate practical experience in subtraction.

Knowingly or unknowingly, student have plenty of division activities in their everyday lives. Any process that involves sharing is after all a form of division. In this unit student will be able to identify division sign (÷) and learn division as repeated subtraction. They will also learn to divide using a number line.

Real-life Application

On a daily basis we need to use division skills in our life. Division is a basic skill we use in daily happenings.

- Budgeting for the monthly expenses, for an event, for shopping etc.
- Dividing living expenses into categories, like grocery, utility bills, medical, shopping, outing etc.

Frequently Made Mistakes

- Using wrong symbol.
- Dividing with zero.
- Remembering Incorrect times table.

Summary of Key Facts

- Division is repeated subtraction.
- 0 divided by any number results in zero.
- Any number divided by itself results in 1.
- Any number divided by 1 results in the number itself.

Model Lesson Plan

Topic

Division by making equal groups

Specific Learning Objective

By the end of the lesson students will be able to:

- make groups of equal number of objects from a set of objects.
- learn commonly used vocabulary for division.

Duration

60 minutes

Key Vocabulary

share, divide, equal group, subtract, backwards, and take away

Resources

Lego blocks, 3 Paper cups

Strategy

Engagement Activity (10 minutes)

Divide the class into four groups. Place 12 lego blocks and 3 paper cups on each table. Ask each group to distribute blocks equally in 3 paper cups. Take verbal feedback from each group that how many blocks are there in each cup? Do all the three cups have equal number of blocks in each group?

Main Developmental Activity (20 minutes)

Starting from the feedback of the above activity, tell them about the equal grouping of objects. It means making groups of equal number of objects from several objects.

Draw 20 stars on the board and make groups of 4 stars by drawing line around every 4 stars. Now involve the students by asking how many groups of four stars have been made? There will be 5 groups. Tell them that grouping equally means we divide a set of objects into equal portions. This is called division. Mathematically it is represented as $20 \div 4 = 5$

Use different vocabulary for division to make them familiar with the topic. Encourage them to make equal groups with sets of different objects like pencils, crayons, coins, and counters etc.

Written Assignment (20 minutes)

Use Pages 115, 116, and 117 for written work. Using the division sign should be emphasised.

Wrap up (10 minutes)

How many equal groups can be made from a set of 10 objects? They can make groups of one, five, and 10 objects.

Suggested Activities

Whole Class Activity (10 minutes)

Ask any ten volunteer students to come and stand in front of the whole class. Provide twenty counters to the remaining group of students. Ask those remaining students to distribute those twenty counters equally to the ten students standing in front of the class.

Try out different combinations for equal sharing of counters for examples, distributing twenty counters among five students, eighteen counters among six students twelve counters among two students etc. Each time the students are successful in distributing the counters equally, write the division equation on the board for example, 20 ÷ 10 = 2, 20 ÷ 5 = 4 etc.

Small Group Activity (10 minutes)

Divide the class into 3 to 4 small groups. Provide twenty counters to each group. Ask them to try different combinations of division,for examples, ten groups of two, five groups of four, four groups of five. Ask them to record these combination on a piece of paper and show it to the teacher at the end. The group who is going to make all correct combinations in shorter span of time will be the winner.

Individual Activity (10 minutes)

Prepare lots of laminated templates of different types and keep them in the classroom for students to practise division using board markers. Refer to pages 111 to 117 to make different types of templates. Let students practise these templates as and when they get the time.

7 Money

Suggested Time Frame

4 periods

Learning Curve

Students get their first idea of money from their shopping expedition with adults. They realise that in exchange of currency notes and coins, they are able to buy a whole lot of things. In this unit they will identify the coins and notes. They will learn about the different denominations of Pakistani currency. They will learn to add and subtract the money.

Real-life Application

Money is used in all aspects of life. For example:

- Total value of items
- Shopping and payment
- Counting money
- School supplies
- Medicine
- Rent
- Utility bills
- Business
- Food
- Phones
- Market

A play shop could be set up for the student where they buy play products (such as plastic fruits and vegetables, toys, books, pencils, crayons, pencil boxes, etc.) using play money.

Summary of Key Facts

- Money is used to pay for goods and services.
- Money is usually in the form of coins and bank notes.
- Different countries use different currencies.
- Paper money was made in China over 1000 years ago.

Frequently Made Mistakes

- Confusions in different denominations of currency.

Model Lesson Plan

Topic
To determine whether enough money is available to make a purchase.

Specific Learning Objective
Students will be able to exchange sufficient currency for purchasing different goods.

Duration
80 minutes

Key Vocabulary
Currency, notes, coins, denomination, price, price tag, shopping, buying and purchase

Resources
Objects with price tags, fake notes, a shopping area arranged by the teacher

Strategy

Engagement Activity (10 minutes)
Call students together. Ask them to think about times they have received money. Students may talk about birthday or holiday gifts. They may also mention allowances.

Try to guide the conversation to a time when someone was providing a good or service.

Ask students to think about different goods and services people pay for, like hospitals, play lands, garbage collectors, guards, etc. Help students to think about all the different ways people spend their money.

Main Developmental Activity (30 minutes)
Explain to students that one thing people need to buy is food. People go to a grocery store or farmer's market to buy this food. Today, students will be using some fake currency to purchase some food in the classroom market.

Next, ask a student to go shopping with you. Show students some items with price tags. Ask the student which two items you should buy. Guide the students through the process of adding the prices together and locating the correct amount of money.

Pretend to be the store owner. Help the students to practise the conversation of asking how much something costs, paying for it, and getting any change. There can be a situation when a students does not have enough money to buy the desired items. Guide the students to understand that she/he can not make a purchase.

Repeat this process with students several times until the class seems to understand the pattern of choosing items, determining the proper amount of money, and paying for the items.

This process should be repeated several times with different students taking turns as the storekeeper and shopper. Whenever possible, allow fellow students to assist with corrections or provide information when students are stumped.

Written Assignment (30 minutes)

Practice sums on Page 123, 124, and 125

Wrap up (10 minutes)

Call students back together. Encourage them to share about their experiences of shopping. What items did they get? Was there anything they were unable to afford? Did they ever run out of change?

Finally, encourage students to think about real life places where they could practise exchanging money for items. Encourage students to actively assist with choosing items and paying for them the next time Mom and Dad need to go to the store.

Suggested Activities

Currency

Whole Class Activity (10 minutes)

Distribute either a note or a coin (fake) to each student (Give notes of Rs.10, 20, 50, 100, 500, 1000 and 5000 and coins of Rs.1, 2, 5 and 10). Let them take turns and let everyone know the amount that they have and also the things that they want to buy with that amount.

Small Group Activity (15 minutes)

Set up a role play area of a super market. Attach tags to each item depicting the prizes. Distribute the money cards or photocopied notes along with coins to all the students. Tell them that today we will do a buying and selling activity. Make two to three students shopkeepers. Ask students to come in pairs to the shopkeepers and buy the things with the money that they have. Let them try adding money to buy different things.

Individual Activity (8 minutes)

Give home assignment to the students to collect different coins (Rs.1, 2, 5 and10) in a match box, bring the match box to school and discuss those coins with friends.

You can also ask students to bring their favourite belonging/ toy from home along with a price tag. Guide students how they will prepare price tags at home. Let them show their favourite belonging/ toy to their friends and inform them about its price.

Addition of Money

Whole Class Activity (10 minutes)

Give home assignment to the students to collect different coins (Rs. 1, 2, 5 and10) in a match box, bring the match box to school. Ask them to open their match box, count the amount of coins that they have with them and tell you the total amount of money that they have.

Small Group Activity (8 minutes)

Divide the class into three to four groups. Give same quantity of fake money/ coins to each group (The teacher will decide about the amount and combination to be given considering the ability of the students). Let students add all the given money/ coins together and write the total number of amount on paper/ white board. The group which counts correctly in a shorter span of time will be the winner.

Individual Activity (10 minutes)

Let students prepare a shopping list (5 to 8 items at least) and write the estimated price in front of each item in rupees. Ask them to add the estimated amount of all items and write the total amount that they need for shopping.

Subtraction of Money

Whole Class Activity (8 minutes)

Pick up 4 to 5 items from the super market that you set for role play. Make sure that all picked up items cost below Rs. 50. Let students assume that they have Rs. 50 with them. Pick one item at a time and tell students about the price, for example Rs. 35. Now ask students if they pay Rs. 50 to the shopkeeper to buy this item, how much money will the shopkeeper return to them? Let them calculate and tell you the answer. Repeat the same procedure for other items.

Small Group Activity (10 minutes)

Use the same role play area of a super market that you already set. Attach tags to each item depicting the prizes. Distribute the money cards or photocopied notes along with coins to all the students. Tell them that today we will do buying and selling activity. Make two to three students shopkeepers. Ask students to come in pairs to the shopkeepers and buy the things with the money that you have. Let them try adding money to buy different things. Also let the students subtract the amount to get the change from the shop keepers.

Individual Activity (10 minutes)

Prepare lots of laminated templates of different types and keep them in the classroom for students to practise addition and subtraction of money using board markers. Refer to pages 122 to 125 to make different types of templates. Let students practise these templates as and when they get the time.

8 Measurement

Suggested Time Frame

6 to 8 periods

Learning Curve

Students have learnt about tall and short; long and short; long, longer, and longest etc. They are also familiar with many words in their daily life, such as length of cloth, height of a child, distance from home to school, etc. which mean the measurement of length. Now they will learn about the actual measurement tools like metre rule measuring the length in metre.

In their everyday life, students are familiar with many words, such as heavy bag, light bag, so many kilos of fruit or vegetables, etc. which indicate weight. Slowly, they discover that the lighter object is not necessarily the smaller one.

Students get a fair idea about capacity by playing with different containers, filling them with sand, clay, and water. Vocabulary, such as full, empty and half-full, is applied to various containers. A bucketful of water, a spoonful of medicine, a cupful of hot chocolate, etc. are the words students are familiar with in their daily life. Situations, such as the petrol tank of the car gets 20 litres of petrol in it,the bathtub is filled with 50 buckets of water, and the bottle has 1 litre of soda, are discussed. Also, comparative capacities, such as 'will a narrow, tall glass hold more water than a flat, wide one?' are discussed. With practical work, student understand that the word capacity refers to the amount of liquid a container can hold.

Measurements play an important role in our lives. People use units of measurement frequently in daily life. For example, cooking, taking medicines, purchasing cloths, weighing the grocery, measuring liquids like juices, milk, and oil etc.

Summary of Key Facts

- There are different properties of things that can be measured, such as distance, weight, temperature, volume, and capacity etc.
- Units for length are km, m, cm, and mm.

- Units for weight are kg, g, mg.
- Units for capacity are l, ml.

Frequently Made Mistakes

- Confusion when selecting an appropriate unit of measurement.
- Improper hand control in measuring wavy lines.
- Errors in measuring the objects.

Model Lesson Plan (Length)

Topic

To measure curved lines.

Duration

60 minutes

Specific learning objective

By the end of the lesson students should be able to measure the length of a curved line using a string.

Key vocabulary

curve, straight, string, measure, and piece

Resources

Metre rule, pieces of strings, cards with a rainbow drawn on it.

Strategy

Engagement Activity (5 minutes)

Ask the students to measure their hand span with a ruler.

Main developmental Activity (30 minutes)

Reinforce the concept of measuring a straight line with a ruler or metre rule. Now draw a curvy line on the board and try to measure it with a ruler. The students will see that it is not possible with a ruler only. Tell them that to measure a curved line we need a string and a ruler. Take a piece of string and measure the curved line by putting the string along the curved line. Put one end of the string on one end of the line moving along the line take the string to the other end of the line. Mark the string at this end. Now measure this length with a ruler. The length of the string will be the length of the curved line.

Written Assignment (15 minutes)

Activity on page 13

Wrap up (10 minutes)

Divide them in 4 groups. Distribute a card with a drawing of rainbow on it. You should have already prepared them. First ask them to colour the rainbow. Then instruct them to measure the length of each shade of the rainbow and write on the card. They will enjoy it.

Suggested Activities

Group Activity (10 minutes)

Pass around a basket of ribbons of assorted lengths, let each student choose and pick a ribbon from the basket. Now the students of each group will compare the length of the ribbons and find out the longest and shortest ribbons. Each group will show its longest and shortest ribbons. Ensure that they match up one end of the ribbons so that they are accurately comparing length. Using a metre rule, they will measure the actual length of their findings.

Small Group Activity (10 minutes)

Divide students in small groups, set a corner in the classroom, place several different objects (for example, ribbons, pencils, twigs, straws etc.) and few rulers in that corner. Let students measure the given objects in centimetres using rulers. Encourage them to record their measurements on a chart paper. They can later compare and discuss the lengths of different objects to find long, longer, longest and short, shorter and shortest.

Individual Activity (10 minutes)

Give each student a piece of chart paper and encourage them to draw the lines of different lengths using a ruler and pencil. Let the peers check the length of their partners' lines.

Model Lesson Plan (Weight)

Topic

Comparing weight

Duration

60 minutes

Specific Learning Objective

By the end of the lesson students will be able to identify:

- 1 kg weight.
- heavier and lighter objects comparing with a 1 kg weight using a balance.

Resources

- A wide variety of concrete objects with varying weights that can be lifted by the students.
- See-saw beam, a balance, and a metric scale.
- Estimate cards marked as heavier or lighter.

Key Vocabulary

kilograms, weights, heavier, lighter, heaviest, lightest, compare

Strategy

Engagement Activity (10 minutes)

It is good to begin with the story of measurement. Tell the students that in olden days, men compared the weight of objects by lifting them in their hands. Students can try this using various objects and make a note of their findings. It in interesting to tell them that on Moon everything weighs less than it does on our planet Earth.

Main Developmental Activity (30 minutes)

Divide the class into four groups. Introduce a real 1 kg weight. Provide a simple weighing scale with pans to them.

Get estimate cards marked as heavier or lighter for weight of the objects for each group before the start of the lesson. After the students have had experience of assessing weights by holding various objects in their hands they will put them in one pan of the weighing balance and in other pan they will put 1 kg weight. In this way they will compare whether the object in the pan is lighter or heavier than 1 kg. Now they will select the heavier or lighter card and put it in the pan with object.

Use of different weighing scales, such as a beam balance, grocer's scales, and metric scales is encouraged to enhance students' interest.

Ask the students to arrange various objects from a group of objects on the table in order of their weight, such as feather, pencil, pebble, and geometry box. They can identify heavier objects and lighter objects using a balance as illustrated on Page 132. These pages in the book are designed in such a way that the topic of weight can be taught easily to the students using practical situations in their everyday life.

Take the students to the school playground and there they work in groups of 3 or 4. Students sit on the see-saw and estimate their weights as heavier and lighter. Ask them to make a line saying 1st, 2nd, 3rd, and 4th according to the weight of the student.

Written Assignment (10 minutes)

Page and 133

Wrap up (10 minutes)

A general round of questions may be done by showing them different objects and asking which is more than 1 kg and which is less than 1 kg?

Suggested Activities

Individual Activity: (10 minutes)

Give each of them a sheet of paper and point some objects in the classroom, for example, a book, a shelf, a chair etc. Ask the students to estimate which objects have a weight less than, more than and about 1 kg, without using a balance. Also ask them to record their predictions on the given sheet of paper and later compare them with their peers' predictions.

Whole Class Activity (10 minutes)

Prepare two identical boxes containing different quantities of rice (heavy and light). Make sure the difference in mass is big enough for students to feel. Ask students to pick them up and compare them by holding one in each hand.

Give students a 1 g weight (or the lightest you have) and a 1 kg weight to pass around and ask them which one is heavy and which one is light.

Show the weighing scale to the students and let them observe how the pointer moves when a 1 kg weight is placed on the scale.

Small Group Activity (10 minutes)

Set up a an area of super market or shop in the classroom. The shop keeper will need a balance scale and weights. Let students buy grocery and have weighed on the weighing scale e.g. pasta, apples, rice etc. Encourage students to buy different quantities of things and get them weighed.

Model Lesson Plan (Capacity)

Topic

Comparing capacity.

Duration

80 minutes

Specific Learning Objective

By the end of the lesson students will be able to:

- identify a container with 1 litre capacity.
- identify the containers with capacity less than and more than 1 litre by comparing with a 1l jug or bottle.

Resources

One litre bottle or jug, containers of different sizes and types holding capacity less than or more than 1 litre, estimate cards

Key Vocabulary

litre, less, more, container, hold

Strategy

Engagement Activity (10 minute)

Help students to give a lot of practical experience to transfer liquid from one container into another to compare the capacity of the containers. You should then introduce the term 'litre' to the students and explain the meaning.

Main Developmental Activity (30 minutes)

Estimate cards can be put in the maths corner in front of different containers. The students guess the capacity of a container as less than or more than 1 litre and write it down on the cards. Then by pouring the liquid in 1 litre container they can justify their answers.

Written Assignment

Page 134, Q.1 and 2

Wrap up (10 minutes)

Ask them to tell the names of some containers they use at home that are less than 1 litre.

Suggested Activities

Whole Class Activity (8 minutes)

Fill 1 litre bottle with water and show it to the students. Inform them about the capacity of the bottle i.e. 1 litre. Take four to five different sizes of containers e.g. a mug, a glass, a bottle (bigger than a litre bottle) etc. Pour the water from 1 litre bottle to different containers and let students observe the capacity of different containers. Discuss which containers can hold 1 litre, more than or less than 1 litre.

Small Group Activity (10 minutes)

Set up a corner in the classroom and keep different sizes of containers and enough card sheets there. Let students predict the capacity of different containers and record their predictions on the given card sheet as more than, less than or about 1 litre. Later, let them measure the capacity of all containers by pouring water from 1 litre bottle and checking if their predictions were right or not.

Individual Activity (10 minutes)

Prepare lots of laminated templates for capacity. Keep them in the classroom for students to practise estimating capacity using board markers. Refer to page 134 to make the templates. Let students practise these templates as and when they get the time.

9 Time

Suggested Time Frame

4 to 5 periods

Learning Curve

Students have learnt about hour and minute hand on an analogue clock. They can tell o'clock and half past time. Now they will learn to read time from a digital clock.

In the previous grade they have learnt the names of the months and number of days in each month. Now they will learn to interpret the information from a calendar by finding the name of the day on a particular date, and vice versa using a calendar.

Real-life Application

Students get an opportunity to interact with clocks and time from early years. They see it at their home, in school, and at shopping places etc. They are familiar with school time, home time, lunch time, bed time, and play time etc. Along with learning to read time they will also learn the importance of time in their lives. They will be able to manage different events and practise to be regular and punctual. Knowing about the names of the days of the week can be useful in various ways in our daily life. We can be more organised to plan our work for the days ahead. All types of appointments, occasions, and functions are mentioned with date and day.

Summary of Key Facts

- The units of time are hour, minute, and second.
- Time is different on different part of the Earth.
- There are twelve months in a year.
- All months have 30 or 31 days except February which has 28 days and every 4th year 29 days which is called a leap year.

Frequently Made Mistakes

- Confusion in hour hand and minute hand.
- Errors in matching the dates and the days.

Model Lesson Plan

Topic
Time

Duration
40 minutes

Specific learning Objective
They will be able to identify the day which comes after and before a particular day, using a calendar.

Key Vocabulary
calendar, week, days, and dates

Resources
Enlarged page of calendar, flash cards with names of the days, current year calendar

Strategy

Engagement Activity (10 minutes)
Tell them that tomorrow you have an appointment with your dentist. Ask them what day it would be tomorrow? If you receive a correct answer appreciate them and tell them that names of the days play an important role in our daily life.

Main Developmental Activity (20 minutes)
Display three flash cards with days' names and ask them to call out the names of the days which are missing. Display the names of the days in order.

Show them a calendar explaining how the days are displayed in each month and how they can find the corresponding day for a particular date.

Now put the enlarged page of the calendar on the board and ask different questions. Like, which day comes after Tuesday, What is the day on 25th of the month, what is the day before 7th of the month?

Written Assignment (10 minutes)
Exercise on page 140

Wrap up (10 minutes)
Hang a current year calendar in the classroom. Give them different dates of the current months and ask the corresponding day.

Suggested Activities

Clocks

Whole Class Activity (10 minutes)

Show students an analogue clock and talk what each hand does. Starting with both hands pointing to 12 o'clock, show how to move the minute hand all the way round the clock, so one hour has passed; the hour hand must now move on to the 1 to show 1 o'clock, an hour later. Explain that you are just showing how the clock hands work over an hour, the hands move so slowly that we don't notice them moving.

Once students are familiar with setting the clock to a particular hour, give them the concept of half past. Stop the minute hand at six, saying that the hand got stuck halfway around the clock. Ask what o'clock they have just seen, e.g. nine o'clock. Explain that the time shown is not o'clock; it is halfway between nine o'clock and ten o'clock and we call this half past nine.

Small Group Activity (15 minutes)

Take the class outside and divide them in two teams. Draw a large circle on the floor using a chalk. Ask students to write numbers in the circle to create an analog clock with no hands. Call two students of any team and given them a piece of chalk each. Now, say a time, for example 2 o'clock and ask the two students to draw the hands. One of the students will draw the hour hand and other draws minutes hand. Repeat the activity with different times like 3 o'clock, half past, 7, and 12 o'clock etc. Now, bring them back to the classroom. Divide them into 4 groups and provide a sheet of paper to each group. Write 5 analogue times on the board. Ask the students to read carefully and write digital time for each analogue time.

The group who write all the digital time correctly will be the winner.

Individual Activity (5 minutes)

Provide lots of laminated templates for individual practice to them. Refer to page 138 for making the templates. Let them work on those templates as and when they get the time.

Calendar

Whole Class Activity (10 minutes)

Make a week wheel out of a card sheet/ card board and divide it in to seven equal sections with each section depicting a day of the week (through drawing or writing) and put a moving pointer in the center (same as the hand of a clock). Show the week wheel to the students and discuss what they do on each day. Talk about why the week is shown as a wheel, encouraging them to think about last and next week. Remind students what they did yesterday and compare what is the same or different about today. Display a week wheel next to the timetable with the pointer pointing at today.

Revisit the week wheel and use a second wheel to show how the months of the year work in the same way. Show the current month on a calendar. Explore how many, Tuesdays, in this month. Revisit the month and count number of Tuesdays, counting

in ordinal numbers. As students become more familiar with the calendar and how the date is written, give them white boards or chits to write today's date in numbers and later the full date. Extend the daily discussion of the date to include seasons, weather, celebrations and any other significant events.

Small Group Activity (10 minutes)

Provide students with slips of paper and let them write the days of the week on each slip. Once they are done with the writing part provide them a strip of paper. Let them paste the names of the days on that strip with the help of glue then joining the ends to make a ring to demonstrate the cyclic nature of each week.

Same activity can be repeated for months of the year.

Individual Activity (10 minutes)

Give home assignment to the students and encourage them to make their own week wheel, illustrating each day with something that they do on it. Ask them to bring their week wheel and share it with the whole class.

Let each student mark their date of birth on the calendar present in the classroom.

10 Shapes

Suggested Time Frame

4 to 6 periods

Learning Curve

In previous years students have built a well-developed base of several shapes i.e cube, sphere, cone, cuboid, ovoid, cylinder, square, rectangle, triangle, circle, pentagon, hexagon and octagon. They can identify the shapes, name them, and relate them with real life objects, and match the shapes with their names. In Book 1 they will be introduced to octagon, nanogon, and decagon identifying their number of faces. They will learn about pyramid and prism through solid models. They will know about the base and number of faces of the pyramid and prism. They will also have basic information about the edges and the vertices of 3D shapes.

Real-life Application

- Shapes in nature: sun, moon, stars, planets, and orbits.
- Shapes in daily life: books', table plate, bottle, a piece of cheese, pizza, biscuit, and ice-cream.

Frequently Made Mistakes

- The students confuse 2D and 3D shapes.
- They make mistakes in finding the number of sides and corners.

Summary of Key Facts

- 3D shapes have faces, edges, and vertices.
- 2D shapes have edges and corners.
- 2D and 3D shapes can be linked to each other.

Model Lesson Plan

Topic

Pyramid and prism

Duration

80 minutes

Specific learning Objective

The student will be able to identify:

- square based pyramid
- triangular prism
- about edges and vertices

Key Vocabulary

pyramid, flat, base, triangular, prism, edge, and vertex

Resources

Wooden shapes.

Strategy

Engagement Activity (10 minutes)

Revise the names of 3D shapes and their link with 2D shapes.

Main developmental Activity (40 minutes)

Show them wooden shapes of a square based pyramid and triangular prism. Show their faces and repeat their names. Differentiate between a pyramid and a prism.

Tell them that a solid object with two identical ends and flat sides is called a prism. Show them the prism in the book on page 144.

Tell them that a pyramid has a base which can be square or a triangle and an apex. Square based pyramid has a square base. Show them the square based pyramid in the book on page 144.

Make them recognise the edge and vertex by touching the shape.

Written Assignment (20 minutes)

Page 145

Wrap up (10 minutes)

Ask them to draw their favourite shape in their notebook. Ask them to name it and colour it.

Suggested Activities

Two Dimensional Shapes

Whole Class Activity (8 minutes)

Show cutouts of 2D shapes to the students in turn, asking students to describe it in their own words. Introduce any vocabulary that they do not use. Encourage them to hold each shape and run a finger along the outer edge, counting the sides and then the vertices. Name each shape and compare their properties. Let them observe similar shapes in various orientations/ environment.

Small Group Activity (5 minutes)

Set up a group sorting activity, asking students to sort cutouts of 2D shapes (square, triangle, circle, pentagon, hexagon, rectangle, oval etc.).

Place a shape in a feely bag or envelope. Gradually reveal part of the shape, asking students what the shape could be and how they know. Ensure that students focus on the properties of the shape rather than simply guessing the shape's name.

Individual Activity (10 minutes)

Let students explore and make different patterns with the cutouts of different shapes.

Also ask them to draw any one thing that they see around them which is square, triangle, circle, pentagon, hexagon, rectangle, oval etc. in shape.

Three Dimensional Shapes

Whole Class Activity (10 minutes)

Use Geometrical Solids (easily available in the market) for introducing the shapes. Let students explore different 3D shapes. Ask: What is the same? What is different? The cube looks the same when it is turned because every face is a square. Cuboids can be laid down or stood up on the longer or shorter faces. Establish that the triangular faces meet at a vertex and shapes like this are called pyramids. Give students a sphere and a cylinder. They both have a curved surface. The sphere has only a single curved surface. Tell them that the cylinder has two ends that are circles joined by a curved surface.

Small Group Activity (10 minutes)

Divide the class into two groups. Put all (or selected) 3D shapes in a feely bag or brown paper envelope. Give the bag to the first team. Let any one student put his/ her hand inside it and pick up any one shape. Tell him/ her not to take the hand out of the bag. Now the student will describe the 3D shape that he/ she is holding in his hand, in his/ her own words and rest of the group members will guess the shape. After the group members will guess the shape, he/ she will take out the shape to check if the group members have taken the right name or not. They will score one point if they are correct. Repeat the same procedure with the other group and so on. The team who will score more points will be the winner.

Individual Activity (10 minutes)

Let students list down the names of the 3D shapes that they have learned. Also ask them to write the name of any one object (beside the name of the 3D shape) that they see in the around them related to that shape.

Patterns

Whole Class Activity (10 minutes)

Collect different objects for example shells, pebbles, beads, counters etc. Make different patterns in front of the students, for example two shells, three pebbles, one counter and then repeat the pattern. Involve students to help you complete the pattern. Also take random responses and encourage students to draw patterns on the board.

Small Group Activity (10 minutes)

Divide the class into four groups and give each group quarter of a chart paper. Let students beautify the chart paper by drawing different beautiful patterns with the help of paints, colours and markers. Make frames from the drawings and hang those frames in your class for decoration purpose.

Individual Activity (10 minutes)

Let students make/ draw different patterns using markers/ colours/ paints/ cutouts and paste these patterns in their Mathematics notebooks.

11 Comparison

Suggested Time Frame

2 periods

Learning Curve

The students already know differences through simple vocabulary, defining the differences, such as long and short, fat and thin, and big and small.

Here, they carry on this visual concept to order or sequence for example, big, bigger, biggest; thin, thinner, thinnest; and so on. They learn to place these objects in order of size, based on the order of numbers learnt in previous classes. They learn to identify the sizes as which will come first then next an so on.

Students' activities during the day are also placed in order, for example, wake up, brush the teeth, take a bath, put on clothes and leave for school. On return from school, the order is different; change clothes, wash hands, say a prayer, have lunch. Let us take an example of an activity, like going to the market to buy a pair of shoes, get into the car, drive to the market, look for shoes, choose shoes, pay money, get into the car and get back home. Such activities help understand situations in everyday life.

Real-life Application

Students will be able to compare the size, length, height, heaviness, and lightness of the objects which we use in daily use.

Frequently Made Mistakes

- Confusion in ordering the three sizes of the objects.
- Error with the concept of long and tall.

Summary of Key Facts

- The size of objects is termed as big, bigger, and biggest.
- The vertical distance between two points is known as height.
- The horizontal distance between two points is known as length.
- The quantity of liquid a container can hold is known as its capacity.

Model Lesson Plan

Topic

Putting things in order

Duration

80 minutes

Specific Learning Objectives

By the end of the lesson the students will be able to compare objects to identify light, lighter, and lightest.

Key Vocabulary

Weight, heavy, light, lighter, lightest

Resources

Objects of different weights

Strategy

Engagement Activity (10 minutes)

Ask them to mention biggest fruit among, a mango, an apricot, and a water melon.

Main Developmental Activity (40 minutes)

Show them a school bag and a book and ask which one is light? The book is light and school bag is heavy. They will differentiate between light and heavy. Now ask them to mention any object which is lighter than the book. Suggest a few objects like a pencil, a pen, an eraser etc.

Suppose they select a pencil, now ask another object lighter than a pencil, say they select an eraser. Now ask them to arrange the selected objects in order; heavy, light, lighter and lightest as below:

School bag, book, pencil, eraser

Suggest a few more objects to arrange in ascending order of weight as given below.

- a car, a bus, and an airplane
- sacks of sugar of weight 1 kg, 2 kg, and 3 kg
- a tennis ball, a football, and a rugby ball
- 10 pebbles, 20 pebbles, and 30 pebbles all of same size

Ask them to arrange each of the group of objects in ascending order.

Written Assignments (20 minutes)

Page 150 and a worksheet made by the teacher

Wrap up (10 minutes)

Ask them to make their own group of objects in their notebooks in descending order of weight.

Suggested Activities

Putting Things in Order

Whole Class Activity (5 minutes)

Take the balls of four different sizes i.e. small, big, bigger and biggest. Show the small and the big ball to the students and ask them about the size of the balls i.e. big and small. Now keep the bigger ball beside the big ball and ask the size of that ball i.e. bigger. Once they understand the concept, show them the biggest ball and introduce the vocabulary.

Repeat the same procedure to introduce the concepts of small/ smaller/ smallest, short/ shorter/ shortest/ long/ longer/ longest, heavy/ heavier/ heaviest and light/ lighter/ lightest.

Small Group Activity (5 minutes)

Provide at least fifteen to twenty random number cards to the students within the range of 100. Ask them to arrange the numbers in ascending (smaller to bigger) or descending (bigger to smaller) order.

Individual Activity (5 minutes)

Provide lots of laminated templates for individual practice to them and let them arrange different objects according to their qualities. Refer to pages 147 to 152 for making the templates. Let them work on those templates as and when they get the time.

12 Position

Suggested Time Frame

3 Periods

Learning Curve

They have learnt many positional words in previous years. They can identify the position of the objects that are up/down, inside/outside, above/ below, before/after, and over/ under. Now they will learn to identify the position regarding left and right.

Real-life Application

- Knowledge of positional words brushes up a child's ability to give and follow directions.
- Positional words describe the location of an object.

Frequently Made Mistakes

- They get confused in differentiating right and left position.
- They make mistakes in identifying before and after position.

Summary of Key Facts

- Positional words describe arrangement in an order (e.g. first, second, third).
- The position of an object is also referred to as ordinal numbers.
- Positional words tell the location of an object.

Model Lesson Plan

Topic

Positional words

Duration

40 minutes

Specific Learning Objectives

By the end of the lesson students will be add to use positional words to describe positions of objects.

Key Vocabulary

Position, below, above, beside, between, inside, outside, in front of, behind

Resources

Students will bring their favorite toys which are easy to handle for them.

Strategy

Engagement Activity (5 minutes)

Ask the students to name some words that tell where an object is or its position.

Listen for the responses and record them on the board. Tell students that today we will be working with words that tell position or where something is located.

Main Developmental Activity (30 minutes)

Ask the students to take out their toys and tell them they are going to play a game with the toys. Tell the students you are going to give them a set of instructions and they are to follow by putting their toys in the identified position.

Give these directions to students one at a time and allow them to complete the action

- Place your toy below your chair.
- Place your toy above your desk.
- Place your toy beside your book.
- Place your toy inside your bag.
- Place your toy outside your bag.
- Place your toy between your desk and your neighbor's desk.
- Place your toy in front of your friend sitting beside you.
- Place your toy behind your chair.

During this time, observe the students' actions and repeat instructions as needed.

Ask the students how positional words help them to find something. Make a list of positional words taking feedback from the students.

Written Assignment (5 minutes)

Page 154

Wrap up

Tell the students to put their toys where they like. Now ask them one by one, 'Where is your toy?'

Suggested Activities

Over and Under, Far and Near, Right and Left

Whole Class Activity (5 minutes)

Play games (Simon Says) with students to reinforce the meaning of position words. Give instructions, for example move forwards five paces, turn left, stand up, sit down, and put the book inside the bag. Ask them to put their hand behind their back, on top of their head, etc. Most of these position words, for example top, middle and bottom, are quite easy words for students to learn and use. Create similar scenarios in the classroom and practise the words using real objects.

Take students to the school garden and let them observe the things that they can see over and under the trees. Also ask them if their peers are standing far or near.

Ask students to show you the hand they write with. Tell them that is their right hand. Discuss with left-handed students that it is more unusual to write with the left hand and explain to them individually that they need to think to themselves that the hand they write with is not their right hand. Show students that another way to find your left hand is to hold up both hands with the palms away from you and the thumbs at right angles. The forefinger and thumb of left hand makes an L shape, L for left.

Small Group Activity (10 minutes)

Position Game – Prepare a basket with different position words written on folded chits. Sing any song and circulate the basket as you sing along. Stop the song and the student who is holding the basket will pick up a chit, read the position word and place the teddy bear accordingly. Continue the game with other students.

Students will be divided in groups. Each group will be given a clue card with directions to reach treasure chest. The clue cards will have directions and position of next clue card. Students have to read the clue card and follow the directions to get the treasure.

Individual Activity (10 minutes)

Let students draw a scene/ picture depicting all position words, for example, over and under, far and near, right and left etc. Also encourage them to label the drawn positions.

Provide lots of laminated templates for individual practice to them and let them practice the concept of position words. Refer page number 154 for making the templates and make similar type of templates. Let them work on those templates as and when they get the time.

Answers of Word Problems

Page 59	Q 1.	a. 19 runs	b. 17 sweets	c. 13 children	d. 16 animals
		e. 14 buns			
Page 67	Q1.	a. 37 coins	b. 27 matches	c. 69 stamps	d. 38 biscuits
		e. 39 children			
Page 73	Q1.	a. 4 plates	b. 6 girls	c. 14 runs	d. 9 pencils
		e.10 parrots			
Page 80	Q1.	a. 16 balloons	b. 14 crayons	c. 21 pages	d. 12 goats
		e. 51 runs			
Page 117	Q4.	a. 5 books	b.4 balloons	c. 10 buns	d. 6 books
		e. 4 apples			
Page 124	Q2.	Rs 80	Q3. Rs 60		
Page 125	Q2.	Rs 15	Q3.Rs 20		

Teacher's Notes

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